

# ***Power Revenue Effects***

SRT Webinar – February 28, 2013  
Presenter: Paul Koski (BPA)

## Power Revenue Effects

### **Methodology for estimating the value of energy effects:**

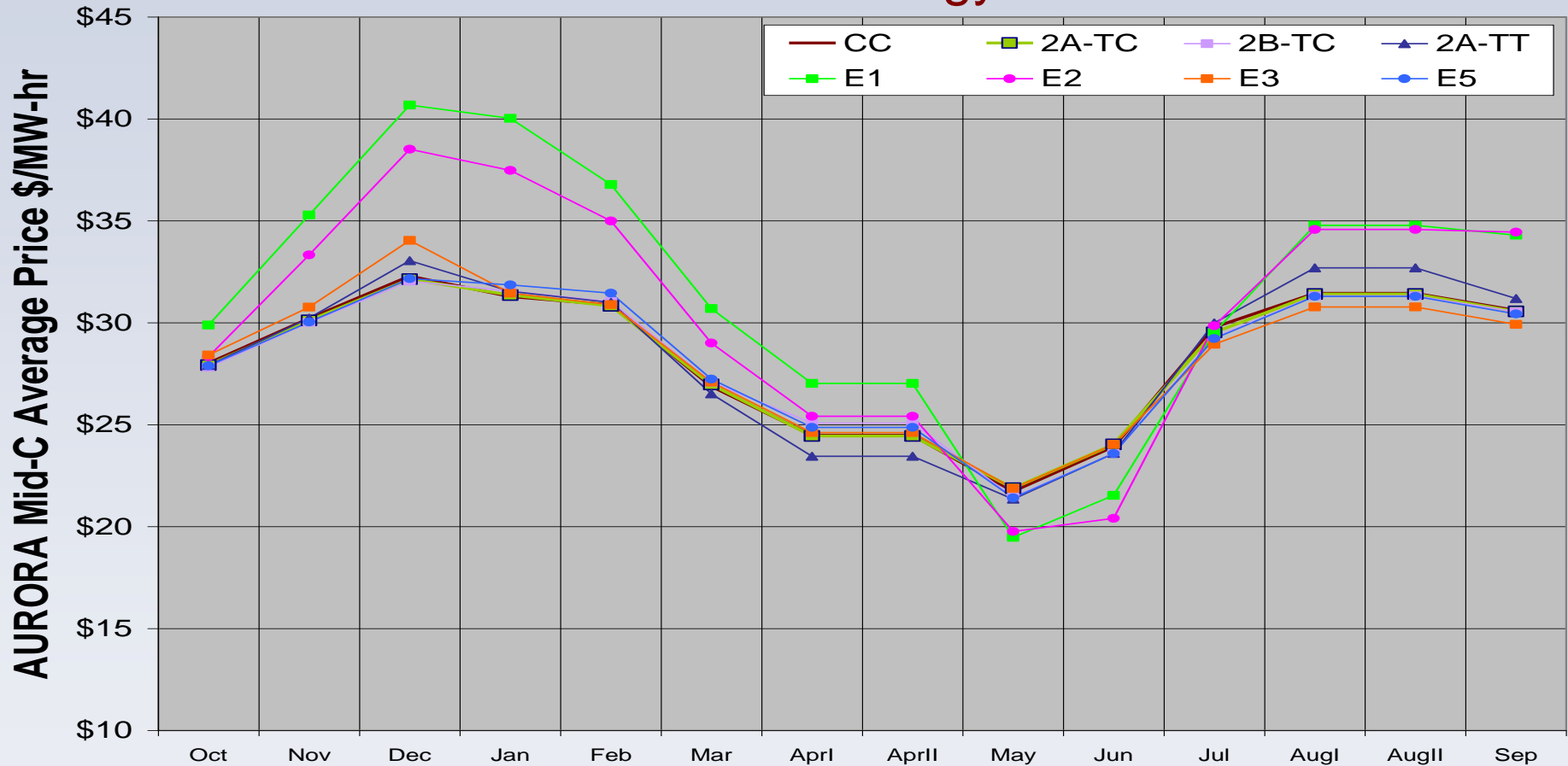
- Market prices were estimated with the industry standard AURORA model
- Energy values were estimated by applying AURORA prices to the estimated energy differences from the RC-CC study

### **Methodology for estimating the value of capacity effects:**

- Capacity effects were estimated based on the capacity-vs-energy curves in the Council's Genesys model
- Capacity effects were valued at \$87,000 per average annual MW per year, the amortized cost of CT resources, based on the Council's 6th Power Plan

# Columbia River Treaty 2014/2024 Review

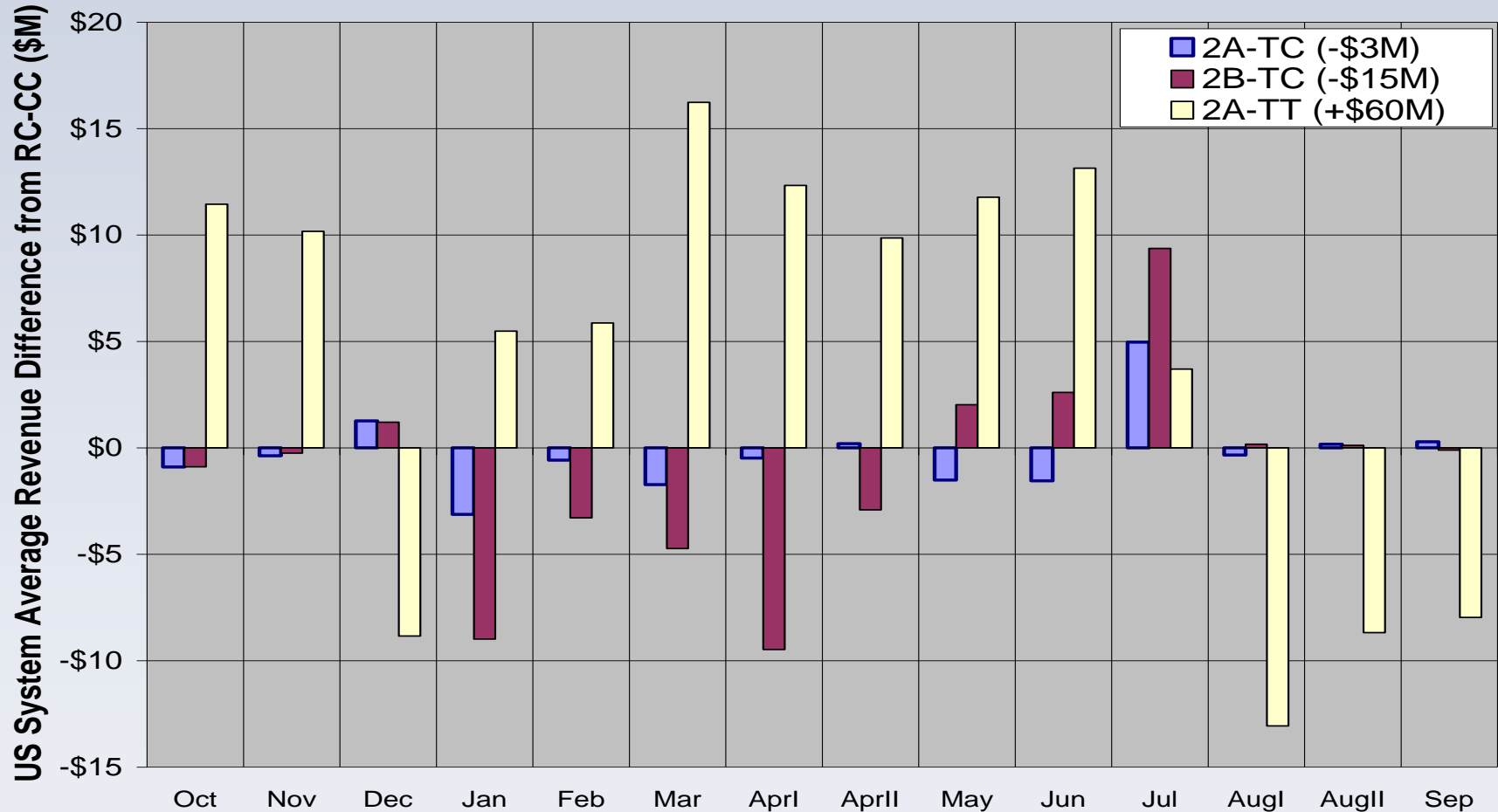
## AURORA Market Prices Used for Value of Energy Effects



The prices for all studies were very similar, except E1 & E2 prices reflected the significant decrease in winter energy and the increase in spring flows.

# Columbia River Treaty 2014/2024 Review

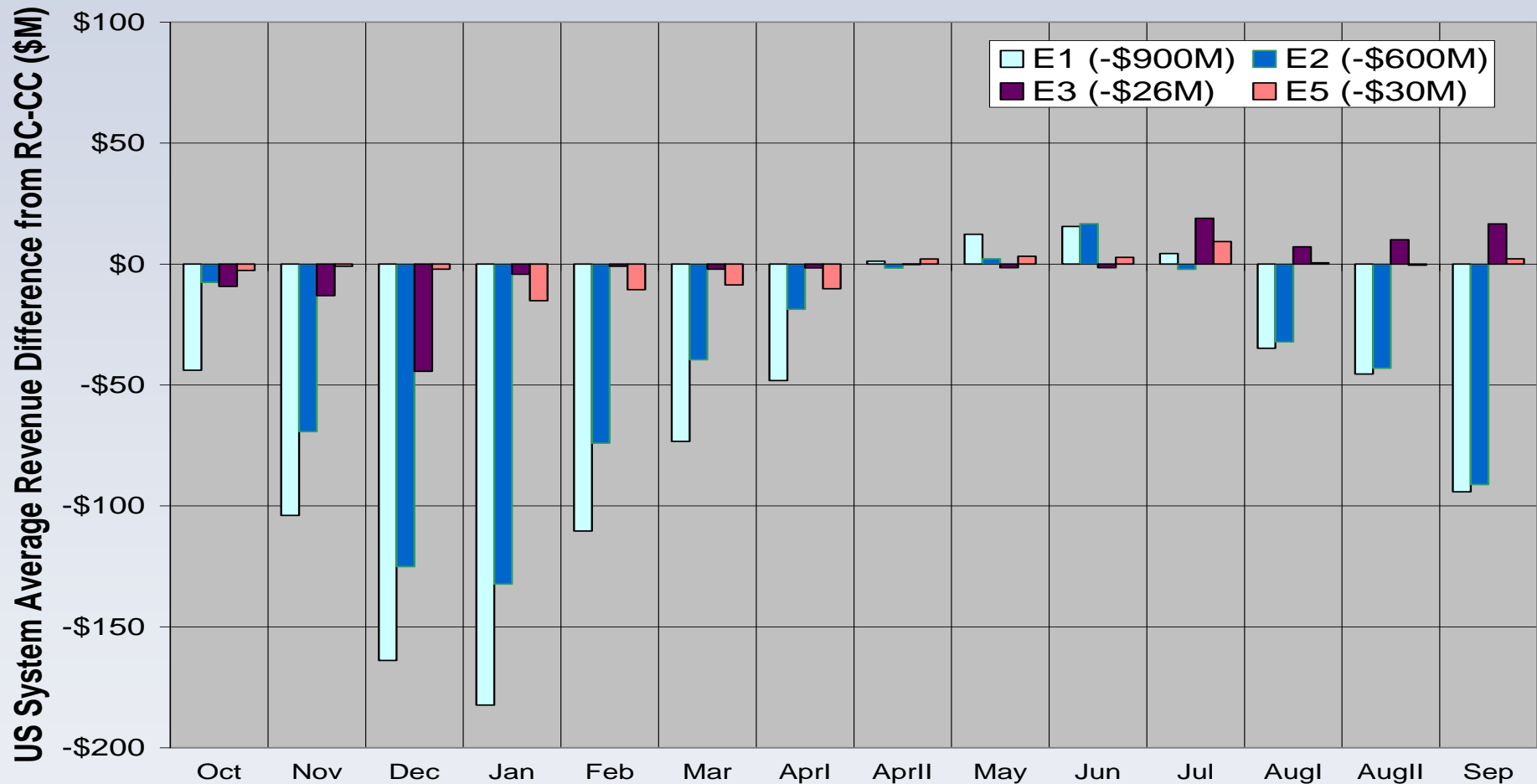
## Power Revenue Effects: U.S. Energy



The 70-yr annual averages are shown in the legend. The numbers in this chart include consideration of the Canadian Entitlement.

# Columbia River Treaty 2014/2024 Review

## Power Revenue Effects: U.S. Energy



The 70-yr annual averages are shown in the legend. The numbers in this chart assume the Canadian Entitlement is equal in all of these scenarios.

# Columbia River Treaty 2014/2024 Review

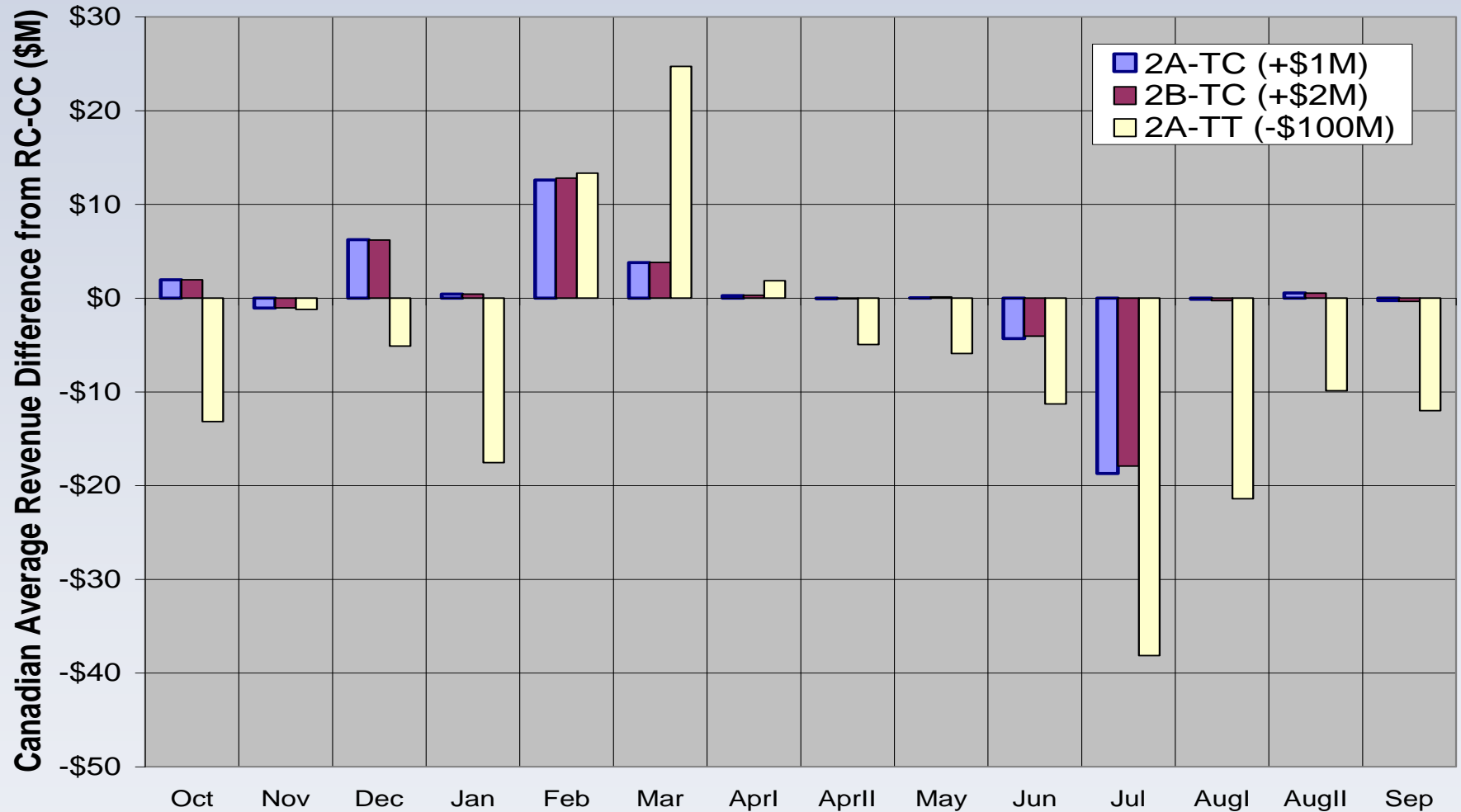
## Power Revenue Effects: U.S. Total Energy & Capacity Compared to RC-CC

	U.S. Energy	U.S. Capacity	U.S. Total
<b>2A-TC</b>	-\$ 3 M	-\$ 0.2 M	<b>-\$ 3 Million</b>
<b>2B-TC</b>	-\$ 15 M	-\$ 1 M	<b>-\$ 16 Million</b>
<b>2A-TT</b>	+ \$60 M	+\$ 110 M	<b>+\$ 170 Million</b>
<b>E1</b>	-\$ 900 M	-\$ 120 M	<b>-\$ 1,200 Million</b>
<b>E2</b>	-\$ 600 M	-\$ 90 M	<b>-\$ 690 Million</b>
<b>E3</b>	-\$ 26 M	-\$ 1 M	<b>-\$ 27 Million</b>
<b>E5</b>	-\$ 30 M	-\$ 3 M	<b>-\$ 33 Million</b>

70-year annual averages, including consideration of the Canadian Entitlement

# Columbia River Treaty 2014/2024 Review

## Power Revenue Effects: Canadian Energy



The 70-yr annual averages are shown in the legend. The numbers in this chart include consideration of the Canadian Entitlement.

## Power Revenue Effects: Canadian Energy



The 70-yr annual averages are shown in the legend. The numbers in this chart assume the Canadian Entitlement is equal in all of these scenarios.

## Total Power Revenue Effects Compared to RC-CC

	Canada	U.S.	Total
<b>2A-TC</b>	+\$ 1 M	-\$ 3 M	<b>-\$ 2 Million</b>
<b>2B-TC</b>	+\$ 2 M	-\$ 16 M	<b>-\$ 14 Million</b>
<b>2A-TT</b>	- \$100 M	+\$ 170 M	<b>+\$ 70 Million</b>
<b>E1</b>	-\$ 200 M	-\$ 1,200 M	<b>-\$ 1,400 Million</b>
<b>E2</b>	-\$ 120 M	-\$ 690 M	<b>-\$ 810 Million</b>
<b>E3</b>	-\$ 1 M	-\$ 27 M	<b>-\$ 28 Million</b>
<b>E5</b>	-\$ 4 M	-\$ 33 M	<b>-\$ 37 Million</b>

70-year annual averages, including consideration of the Canadian Entitlement, but not including Canadian Capacity effects

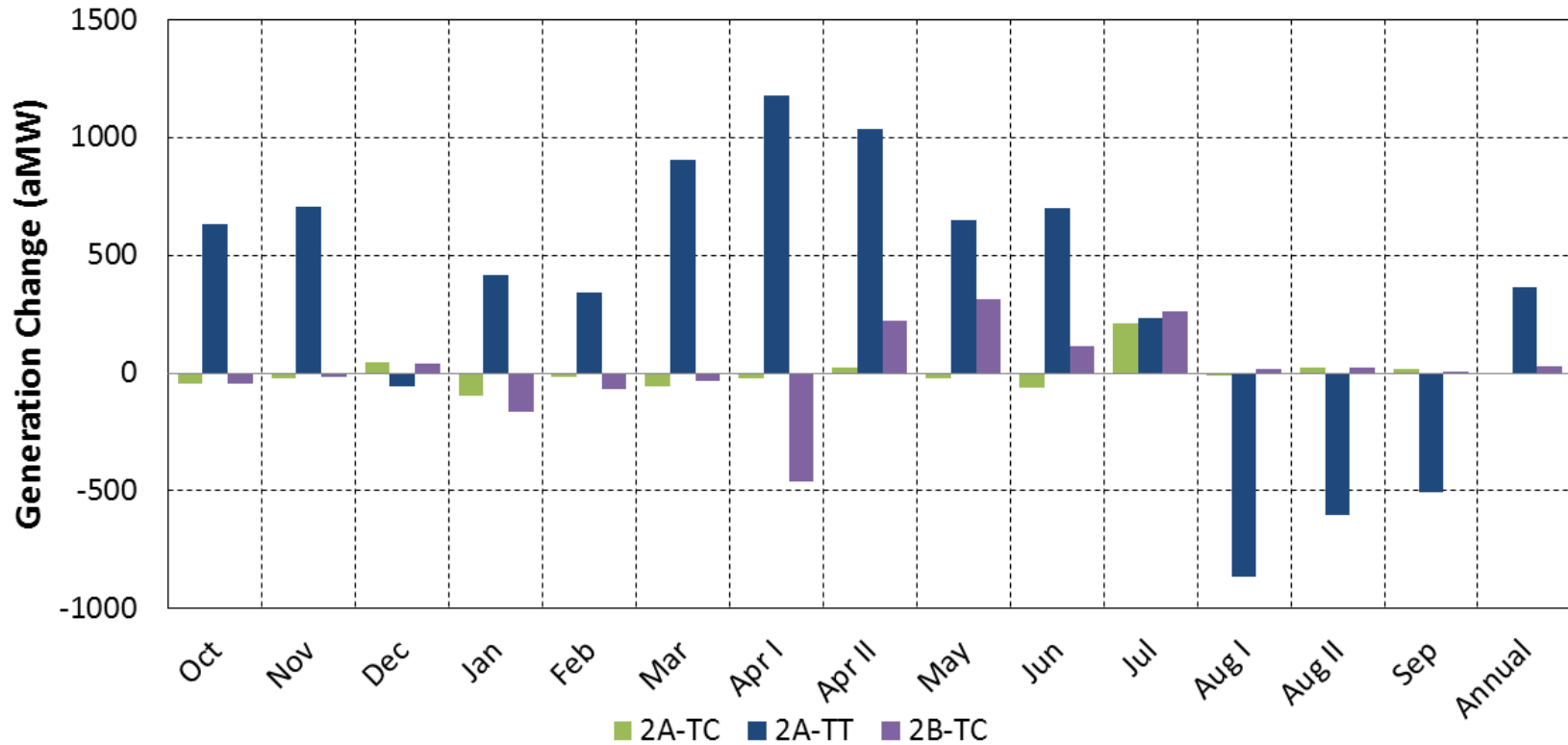
## ***120 Hour Generation: Superpeak***

# ***120 Hour Generation Summary (All Water years)***

- 120 Hour Generation (also known as **Superpeak**) is defined as the average generation for the highest 120 hours in a month (or 60 hours in a split month)
- This generation is critical to meeting the peak system loads
- 120 Hour Generation was modeled using an hourly model, HOSS, for the Federal System
  - HOSS takes monthly HydSim generation and creates an hourly generation schedule
  - The hourly generation is then grouped into blocks such as Heavy Load, Light Load, and Superpeak

# Columbia River Treaty 2014/2024 Review

**Federal System 120 Hour Generation: Change in Generation from Current Conditions (Less 560 aMW Under Treaty Continues Alternatives)**

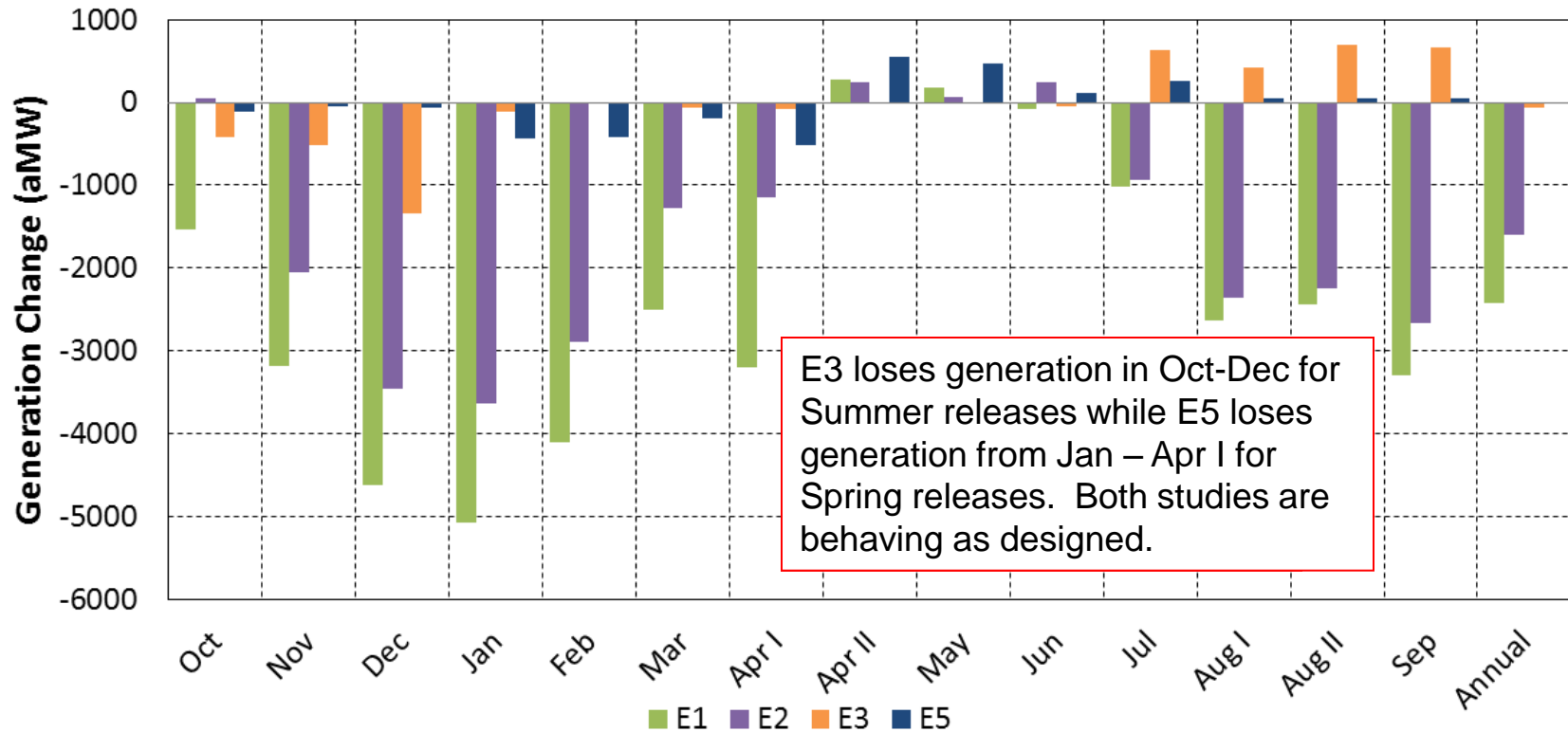


**Federal System - 120 Hour Generation (aMW) with 560 aMW Subtracted from TC Alternatives**

	October	November	December	January	February	March	April I	April II	May	June	July	August I	August II	September	Annual
All Water Years															
2RC-CC	7336	8922	11193	12003	11248	11235	10478	10552	12450	12264	10821	9963	8530	7928	10427
2A-TC	7294	8902	11239	11907	11233	11179	10456	10573	12431	12203	11032	9953	8553	7945	10425
2A-TT	7968	9630	11137	12417	11590	12141	11656	11588	13102	12967	11055	9098	7925	7422	10793
2B-TC	7294	8904	11236	11841	11179	11203	10020	10773	12766	12377	11082	9983	8551	7930	10455

# Columbia River Treaty 2014/2024 Review

**Federal System 120 Hour Generation: Change in Generation from Current Conditions (Less 560 aMW Under Treaty Continues Components)**



**Federal System - 120 Hour Generation (aMW) with 560 aMW Subtracted from TC Alternatives**

	October	November	December	January	February	March	April I	April II	May	June	July	August I	August II	September	Annual
All Water Years															
2RC-CC	7336	8922	11193	12003	11248	11235	10478	10552	12450	12264	10821	9963	8530	7928	10427
E1	5804	5731	6574	6930	7136	8734	7283	10832	12626	12180	9796	7330	6094	4637	8000
E2	7378	6870	7728	8362	8362	9962	9323	10799	12518	12512	9880	7607	6276	5265	8824
E3	6909	8398	9848	11886	11230	11168	10396	10542	12433	12210	11458	10384	9218	8594	10363
E5	7221	8880	11134	11573	10825	11035	9968	11105	12916	12384	11078	10011	8587	7983	10405

# Generation Impact Summary

### ■ Federal System

- Generally, the changes to the Federal 120-hour generation were the same as what had been previously shown for the changes to average generation for the US System
- There was little change to the annual average 120 hour generation in 1A-TC and 2B-TC
- 2A-TT showed the largest decreases in Aug - Sep with increases occurring in most other periods, the largest being Jan - Jun
- E1 and E2 showed large losses to generation in all periods except April - June